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A Scientometric Analysis of the Journal Information and Organization

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Abstract
The main aim of the study is to analyze the different quantitative aspect of the journal, Information and Organization, which includes: year wise growth of articles, authorship pattern of articles, collaboration index, degree of collaboration, geographical distribution of the research output, productivity and ranking of authors etc. A scientometrics analysis of the international journal 'Information and Organization' was conducted based on the articles published in the journal during 2003 to 2017. It covers 193 articles contributed by 407 authors from 138 institutions of 28 various countries. We have used several scientometric tools to see the different aspects of the journal. We identified the year wise distribution of articles, authorship patterns, and geographical distributions. In addition we have identified productivity of authors; most productive organisation.The study has the following findings: the US is the most productive country. Most of the articles are written by multiple authors. In 15 years, total 193 articles were published in the journal Information and Organization by various researchers/scientists and also it can be seen that the maximum no of articles (18) published in the year 2013 with AGR 20%. The overall AAPP and PPA was 2.10, 0.47 respectively during the period 2003-2017. The highest number 28 (14.50%) of publications were published in the subject of IS/IS development/Gender & IS/ IS Project management/ IS & sustainability research/Health information System/IS security. Most prolific authors were Kalle Lyytinen from Sweden and Neil Pollock from UK. The research trend was towards ICT and Information Systems.

Keywords - Authors productivity, Collaboration Index, Trend of research, Authorship pattern, AGR, AAPP, APA, Bibliometrics.

1. Introduction

Library and Information Science (LIS) field is growing rapidly with the advancement of Information Technology (IT). It is emerging as an interdisciplinary subject in the field of social science. So, it is important to understand the relationship between IT and LIS and also the trend of research in this field. Information and Organization is a famous quarterly journal publishes scholarly articles related to IT and its relationship with the social organizations. It gives an overview of the trend of research in the above mentioned field. So, by analyzing the contents of the journal, we could infer the future research areas in LIS, the emerging technologies and their significance.

2. Journal Information and Organization

It is a well known international quarterly journal in the field of Information Science and others (such as history, information systems, philosophy, organization science, political science, psychology, sociology, anthropology, computer science etc.) published by Elsevier, formerly known as Accounting, Management and Information Technologies. It publishes scholarly articles on information technologies and social organization based on empirical research and relevant theory. It is a quarterly journal with current impact factor 6.30 with Cite Score 9.7.

3. Objectives

The main aim of the study is to analyze the content of the journal Information and Organization and also the different quantitative aspect of the journal, which includes:

- Year wise growth of articles and Annual Growth Rate (AGR) of articles.
- Authorship pattern of single and multiple authored articles.
- Measurement of Collaboration index and Degree of Collaboration.
- Geographical distribution of the research output.
- Productivity of authors.
- Ranking of authors.
- Average Author per Paper (AAPP) and Productivity per Author (PPA).
- Subject/Area wise distribution of articles.
- Country wise distribution of articles.
- Trend of research.

4. Review of Literature

A review of literature is very much necessary for any kind study. There are several studies related to content analysis of a journal. Lokhande (2013) investigated the trends of LIS open access Journal "ALIS" by analyzing articles, authors and LIS subjects covered in the articles. Walia & Kaur (2012) identified the types of research papers/articles, current trends in the choice of subjects, being included in the Library and information science (LIS) journal literature published from UK and USA. Their study was aimed to find out the impact of information and communication technology (ICT) on LIS subject fields. A content analysis of 165 research papers and journals articles published in the year 2008 in six LIS journals was conducted. Davarpanah & Aslekia (2008) presented a quantitative study of productivity, characteristics and various aspects of global publication in the field of library and information science (LIS). A total of 894 contributions published in 56 LIS journals indexed in SSCI during the years of 2000-2004 were analyzed. Ocholla & Ocholla (2007) investigated the research in LIS in South Africa during 1993-2006 and observed that research collaboration through co-authorship was encouraging at 69 percent. According to the results of this study management, information retrieval and information services dominated the LIS research in South Africa. Dorner (2001) reported on a study of content of library and information science journals published in Australasia. The purpose of this study was to analyze how the content of the Australasian LIS journals affecting knowledge creation among LIS community of professionals, technicians, academicians and students of Australasia.

5. Scope and Limitations

It is restricted to only to the "Information and Organization" journal. It is based on the articles published in the above mentioned journal during 2003 to 2017. It covers 193 articles contributed by 407 authors from 138 institutions of 28 various countries. The analysis is divided into ten categories; some more categories may be incorporated to study some other aspects. The journal is selected randomly among good impact factor journals with at least 15 years of publication history.

6. Methodology

This study has been structured to analyze the content of the articles published in Information and Organization" journal. Survey method has been used to collect the data. For the analysis of the study, 193 articles contributed by 407 authors from 138 institutions of 28 various countries published during the year 2003 to 2017. The details with regard to each published article such as year wise growth of articles, authorship pattern of articles, collaboration index, degree of collaboration, geographical distribution of the research output, productivity and ranking of authors, trend of research, place of publication, etc. MS-Excel was used for organization and analysis of the data.

7. Analysis of the Journal

The details analysis of the study is presented further. This analysis is divided into ten categories. Under each category separate explanation has been given.

7.1 Year wise distribution of articles

In table 1, it can be observed that during 2003-2017, total 193 articles were published in the journal Information and Organization by various researchers/scientists and also it can be seen that the maximum no of articles 18 (9.33%) published in the year 2013 and lowest number of articles 9 (4.66%) published in the year 2007. Now if we consider the Annual growth rate (AGR) i.e. the change in the value of a measurement over the period of a year. AGR is measured using the following formula given by (Velmurugan and Radhakrishnan's formula), which is given below:

(AGR = End value –First value / First value * 100)

Sl. No.	Year	Volume no.	Issue no.	No. of articles	Percentage	AGR (%)
1	2017	27	1 – 4	16	8.29	60
2	2016	26	1 – 4	10	5.18	-9.09
3	2015	25	1 – 4	11	5.70	-15.38
4	2014	24	1 – 4	13	6.74	-27.77
5	2013	23	1 – 4	18	9.33	20
6	2012	22	1 – 4	15	7.77	36.36

7	2011	21	1 – 4	11	5.70	10
8	2010	20	1 – 4	10	5.18	-33.33
9	2009	19	1 – 4	15	7.77	15.38
10	2008	18	1 – 4	13	6.74	44.44
11	2007	17	1 – 4	9	4.66	-25
12	2006	16	1 – 4	12	6.22	-20
13	2005	15	1 – 4	15	7.77	7.14
14	2004	14	1 – 4	14	7.25	27.27
15	2003	13	1 – 4	11	5.70	-
			Total	**193**	**100.00**	

Table 1: Year wise distribution of articles & AGR

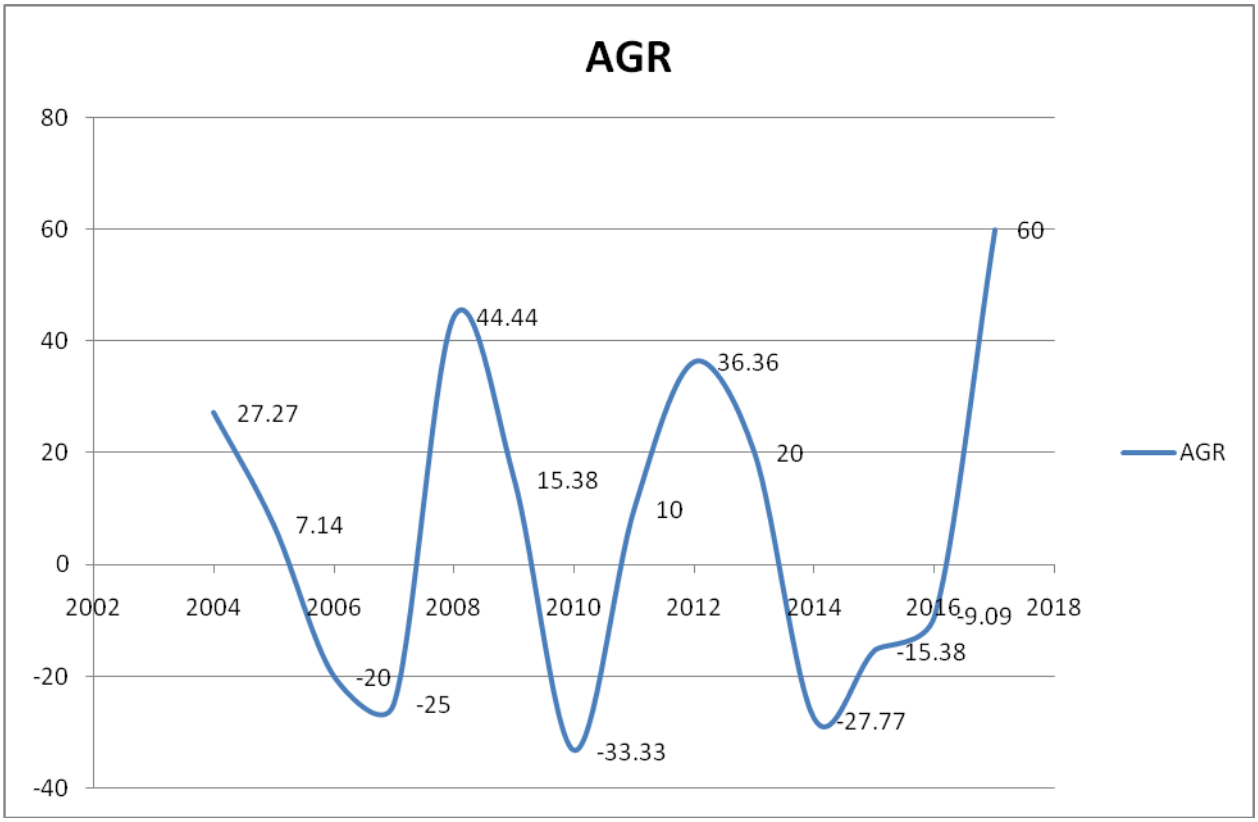

Figure 1: Annual Growth Rate(AGR)

7.2 Growth rate of articles

From table 2, it is noticed that the total no. of articles published in between 2013-2017 is 68, 2008-2012 is 64 and total no. of articles published in between 2003-2007 is 62. The 5 year means were 13.6, 12.8 and 12.2 respectively. So, mean is slightly higher for the time range 2013-2017. Now if we would like to judge the growth rate of articles in this time range, it is calculated as follows: (((68-64)/64)*100%), i.e. only 6.25%. So the rate of growth of articles in the last five years (2013-2017) was 6.25%.

Sl. No.	Year	No. of articles		5 years Mean
1	2017	16	Articles published in between 2013-2017	**13.6**
2	2016	10		
3	2015	11		
4	2014	13		
5	2013	18		
6	2012	15	Articles published in between 2008-2012	**12.8**
7	2011	11		
8	2010	10		
9	2009	15		
10	2008	13		
11	2007	9	Articles published in between 2003-2007	**12.2**
12	2006	12		
13	2005	15		
14	2004	14		
15	2003	11		

Table 2: Growth rate for articles

7.3 Authorship patterns of articles

Table 3 shows the authorship patterns of articles. It shows that the single author 49 (12.03%), whereas multiple authors were 358 (87.97%). So, the authorship pattern was towards multiple authored articles. Now the collaboration index can be calculated using this formula:

Collaborative Index=Total no. of authors/Total multiple authored paper

The overall collaborative index was highest in the year 2006 i.e.1.31 and overall 1.13 during the period 2003-2017.

Sl. No.	Year	Volume no.	Authors		Total no. of authors	Collaborative Index(CI)
			Single	Multiple		
1	2017	27	6	22	28	1.27
2	2016	26	2	21	23	1.09
3	2015	25	0	28	28	1.00
4	2014	24	2	32	34	1.06
5	2013	23	7	28	35	1.25
6	2012	22	2	30	32	1.06
7	2011	21	2	21	23	1.09

8	2010	20	4	14	18	1.28
9	2009	19	4	32	36	1.12
10	2008	18	1	28	29	1.03
11	2007	17	2	17	19	1.11
12	2006	16	5	16	21	1.31
13	2005	15	2	29	31	1.06
14	2004	14	6	22	28	1.27
15	2003	13	4	18	22	1.22
		Total	**49 (12.03)**	**358(87.97)**	**407(100)**	**1.13**

Table 3: Authorship patterns of articles

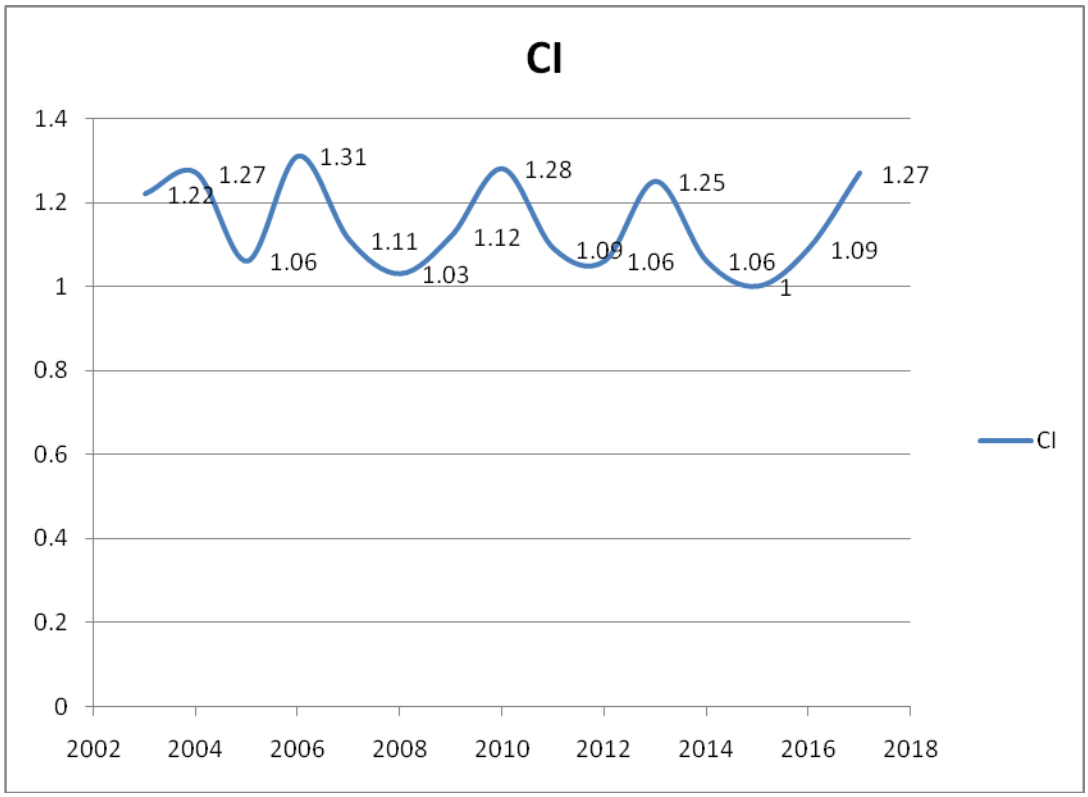

Figure 2: Collaborative Index

7.4 Productivity of Author

Table 4 shows the average author per paper (AAPP) and productivity per Author (PPA), which are being calculated using the below mentioned formula:

Average Author per Paper (AAPP) = Number of authors / Number of papers

Productivity per Author (PPA) = Number of papers / Number of authors

It is seen from the table that AAPP was highest in the year 2014 i.e.2.61 and lowest in the year 2007 i.e.1.18. PPA was highest in the year 2006 and 2017i.e. 0.57 and lowest in the year 2014 i.e.0.38. The overall AAPP and PPA was 2.10, 0.47 respectively during the period 2003-2017.

Sl. No.	Year	Paper	Authors	AAPP	PPA
1	2017	16	28	1.75	0.57
2	2016	10	23	2.30	0.43
3	2015	11	28	1.75	0.39
4	2014	13	34	2.61	0.38
5	2013	18	35	2.18	0.51
6	2012	15	32	2.13	0.46
7	2011	11	23	1.43	0.47
8	2010	10	18	1.80	0.55
9	2009	15	36	2.25	0.41
10	2008	13	29	2.23	0.44
11	2007	9	19	1.18	0.47
12	2006	12	21	1.75	0.57
13	2005	15	31	1.93	0.48
14	2004	14	28	2.00	0.50
15	2003	11	22	1.37	0.50
	Total	**193**	**407**	**2.10**	**0.47**

Table 4: Productivity of Author

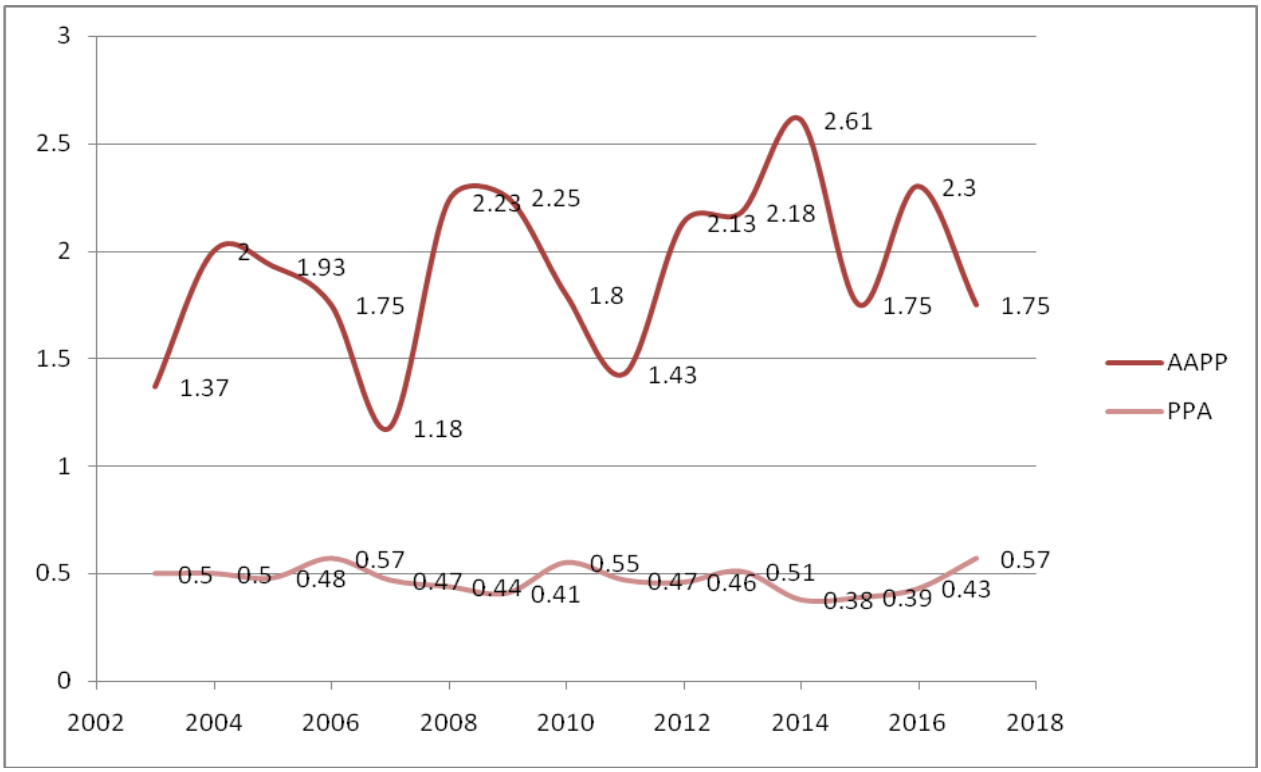

Figure 3: AAPP and PPA

7.5 Degree of Collaboration

Degree of Collaboration among the authors can be calculated using the Subramanyam formula, which is:

Degree of Collaboration (DC) = Nm / Nm+Ns

Where, DC = Degree of Collaboration

Nm = Number of multiple authored paper

Ns = Number of single authored paper

It is seen from the table that DC was exactly equal to 1 in the year 2015 and the lowest DC was 0.762 which was in the year 2006. The overall DC was 0.880 during the period 2003-2017.

Year	Single Author Paper(Ns)	Multiple author Paper(Nm)	Total (Ns+Nm)	Degree of Collaboration(DC)
2017	6	22	28	0.786
2016	2	21	23	0.913
2015	0	28	28	1.000
2014	2	32	34	0.941
2013	7	28	35	0.800
2012	2	30	32	0.938
2011	2	21	23	0.913
2010	4	14	18	0.778
2009	4	32	36	0.889
2008	1	28	29	0.966
2007	2	17	19	0.895
2006	5	16	21	0.762
2005	2	29	31	0.935
2004	6	22	28	0.786
2003	4	18	22	0.818
Total	**49(12.03)**	**358(87.97)**	**407(100)**	**0.880**

Table 5: Degree of Collaboration

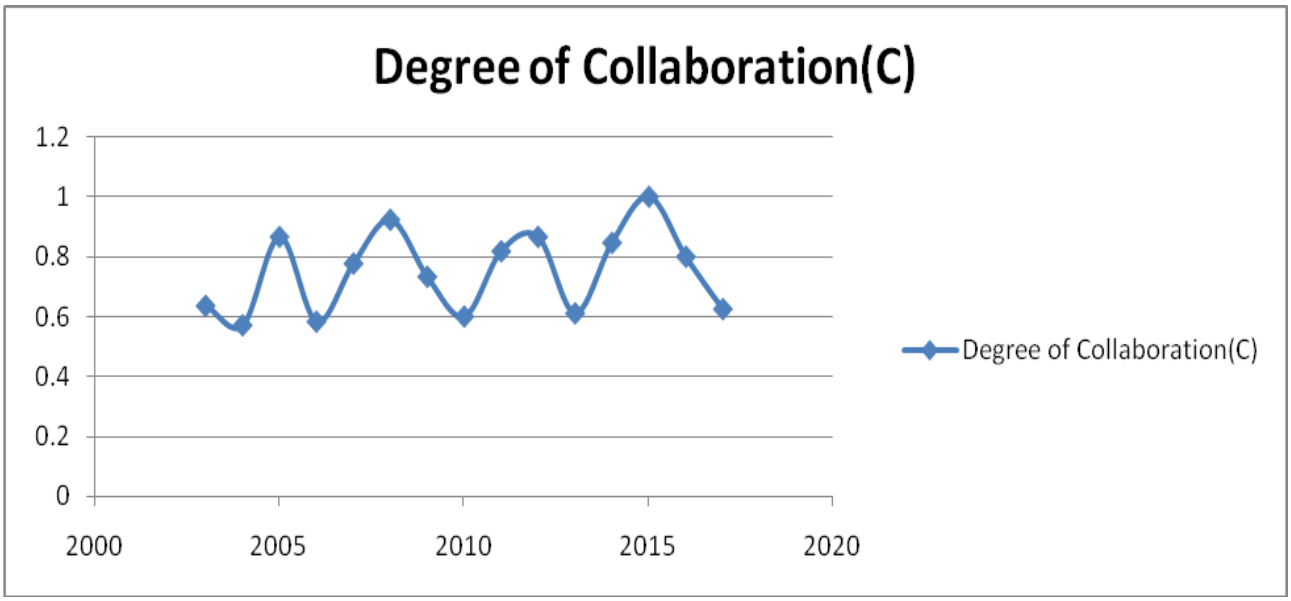

Figure 4: Degree of Collaboration

7.6 Geographical distribution of the research output

Here it is observed that, there were 28 countries contributed to produce 193 articles. Table 4 shows the country wise ranking with number of contributions and the contribution percentages. As expected, the USA is the top producing country with 146 publications (37.63%) of the total output.

Sl. No.	Rank	Country	No. of contributions	% of contribution
1	1	USA	146	37.63
2	2	UK	97	25.00
3	3	Norway	24	6.19
4	4	Sweden	18	4.64
5	5	Canada	21	5.41
6	6	France	9	2.32
7	7	Australia	10	2.58
8	8	Denmark	8	2.06
9	8	India	5	1.29
10	9	New Zealand	5	1.29
11	10	Greece	3	0.77
12	10	Italy	3	0.77
13	10	Singapore	4	1.03
14	10	Spain	4	1.03
15	10	Taiwan	5	1.29
16	11	Brazil	4	1.03
17	11	Finland	2	0.52
18	11	Japan	2	0.52
19	11	Netherland	2	0.52
20	11	Switzerland	5	1.29

21	12	Chile	1	0.26
22	12	Cyprus	1	0.26
23	12	Dominican Republic	1	0.26
24	12	Egypt	1	0.26
25	12	Germany	1	0.26
26	12	Ireland	4	1.03
27	12	Poland	1	0.26
28	12	Portugal	1	0.26
		Total	**388**	**100**

Table 6: Geographical distribution of the research output

7.7 Ranking of authors

It can be observed from table no. 5 that, most prolific authors were Kalle Lyytinen from Sweden and Neil Pollock from UK, who had the highest number (5) of the publication. Six authors had 3 publications, twenty eight authors with 2 publications, 113 authors with single publications under their belt.

Sl. No.	Rank	Name of author	Name of the country	No. of articles
1	1	Kalle Lyytinen	Sweden	5
2	1	Neil Pollock	UK	5
3	2	Daniel Robey	USA	3
4	2	Mike Chiasson	UK	3
5	2	Panos Constantinides	UK	3
6	2	Paul M. Leonardi	USA	3
7	2	Robin Williams	UK	3
8	3	Robin Teigland	UK	3
9	3	Alain Ross	Canada	2
10	3	Alexander Styhre	Sweden	2
11	3	Michael Barrett	UK	2
12	3	David Knights	UK	2
13	3	David Ribes	USA	2
14	3	Erica L. Wagner	USA	2
15	3	Helen J. Richardson	UK	2
16	3	Jonny Holmström	Sweden	2
17	3	Julie Rennecker	USA	2
18	3	Leiser Silva	USA	2
19	3	Lucas D. Introna	UK	2
20	3	Michel Avital	Netherland	2
21	3	Niall Hayes	UK	2
22	3	Nicholas Berente	USA	2
23	3	Richard J. Boland	USA	2
24	3	Rudy Hirschheim	USA	2
25	3	Sundeep Sahay	Norway	2
26	3	Susan V. Scott	UK	2

27	3	Vidar Hepsø	Norway	2
28	3	Wanda J. Orlikowski	USA	2
29	3	Youngjin Yoo	USA	2
30	3	Yutaka Yamauchi	USA	2
31	3	Allen S.Lee	USA	2
32	3	Emmanuelle Vaast	Canada	2
33	3	Dionysios S.Demetisa	UK	2
34	3	John Mingersa	UK	2
35	4	Others	Others	113
Total				**193**

Table 7: Ranking of authors

7.8 Ranking of organizations:

In this table, it is observed that, there were organizations involved in the publication of articles in this journal. Case Western Reserve University and the London School of Economics had 8 publications. University of Manchester had 6 publications. University of Oslo and University of Edinburgh with 5 publications, 4 institutions had 4 publications, 8 institutions had 3 publications, and 25 institutions had 2 publications like that other 9 institutions had single publications.

Sl. No.	Organizations	No. of publications
1	Case Western Reserve University	13
2	London School of Economics	12
3	University of Edinburgh	10
4	Georgia State University	9
5	University of Manchester	9
6	University of Oslo	7
7	Copenhagen Business School	7
8	Lancaster University	7
9	University of Warwick	6
10	University of Kent	6
11	Stockholm University	5
12	Norwegian Univ. of Science and Technology (NTNU)	4
13	University of Salford	4
14	Michigan State University	4
15	ETH Zürich	4
16	Umea University	4
17	University of Maryland	4
18	University of Houston	3
19	University of Cambridge	3
20	University of Calgary	3
21	Northwestern University	3

22	Louisiana State University	3
23	Cornell University	3
24	Temple University	3
25	University of Central Florida	3
26	Stanford University	3
27	Massachusetts Institute of Technology	3
28	Bentley University	2
29	Binghamton University	2
30	University of Oulu	2
31	Drexel University	2
32	Georgetown University	2
33	HEC Montréal	2
34	IIM Ahmedabad	2
35	Kyoto University	2
36	Nanyang Technological University	2
37	Pennsylvania State University	2
38	UCLA Anderson School of Management	2
39	University of Alabama	2
40	University of Amsterdam	2
41	University of Auckland	2
42	University of California	2
43	University of Keele	2
44	University of Michigan	2
45	University of Regina	2
46	University of Melbourne	2
47	Sao Paulo Business School	2
48	University College Cork	2
49	University of Wisconsin	2
50	Loughborough University	2
51	National Cheng Kung University	2
52	Manchester School of Management, UMIST	2
53	University of East Anglia	2
54	Others	63
	Total	**193**

Table 8: Ranking of organizations

7.9 Area of Research and Number of Articles

It is observed that the trend of research was moving towards an Information System (IS)/IS development/Gender & IS/IS Project management/IS & sustainability research/Health information System/IS security. There were 28 articles on the above topics. 25 topics were on ICT/ICT organization, 12 topics on Sociomateriality.

Sl. No.	Area of Research	No. of Articles
1	IS/IS development/Gender & IS/ IS Project management/ IS & sustainability research/Health information System/IS security	28
2	ICT/ICT organization	25
3	Sociomateriality	12
4	KM technologies/KM/Knowledge Transformation and sharing	7
5	Enterprise resource planning (ERP)	5
6	Innovative Technology/Social construction of technology	5
7	Information Principle/Information networking	5
8	E-government	3
9	CRM	3
10	Media/Media theory/Media Management	3
11	Mobile technology	3
12	Social Software	2
13	Information and Communication/Information Asymmetry	2
14	Digital Library	2
15	Open Source Software (OSS)	2
16	Community Management	2
17	E-business	2
18	Behavior Analysis/organisation behavior	2
19	Research design	2
20	boundary management	2
21	Management accounting system	2
22	Organisation analysis/organisation security policy	2
23	Citation Analysis	1
24	Open Science Grid (OSG)	1
25	digital and physical data	1
26	Critical Theory	1
27	Product Lifecycle Management Technology (PLM)	1
28	European Social Fund	1
29	structured–pragmatic–situational (SPS)	1
30	ontology and semantic interoperability	1
31	Remote diagnostic system	1
32	Internet Crime	1
	Total	**193**

Table 9: Area of research and number of articles

7.10 Year Wise Trend of Research

In this table, it is seen that the research trend is towards ICT and Information Systems. This may be the fact that this journal is dealt with information and its applications.

Year	Trend of Research
2017	ICT & Information System
2016	Emerging Technology, Social Networking & Information System
2015	ICT & Information System
2014	Sociomateriality
2013	ICT & Sociomateriality
2012	ICT & Information System
2011	IS & Sustainability Research
2010	ICT & Information System
2009	Knowledge Management & Information System
2008	ICT & Information System
2007	ICT & Information System
2006	ICT & Information System
2005	ICT & Networking
2004	ICT, Internet & Information System
2003	Expert System, Software

Table 10: Year wise trend of research

8. Findings

The overall findings are given below:

- USA was the most productive country among 28 countries (37.63%) followed by UK (25%).
- Majority of the affiliated institution were from USA followed by UK, Sweden.
- Most of the articles were written by multiple authors (87.97%) and the remaining by single authors.
- Maximum numbers of articles (18) were published in the year 2013 and the lowest numbers of articles (9) were published in the year 2007.
- AAPP was highest in the year 2014 i.e.2.61 and lowest in the year 2007 i.e.1.18. PPA was highest in the year 2006 and 2017i.e. 0.57 and lowest in the year 2014 i.e.0.38. The overall AAPP and PPA was 2.10, 0.47 respectively during the period 2003-2017.
- The highest number 28 (14.50%) of publications were published in the subject of IS/IS development/Gender & IS/ IS Project management/ IS & sustainability research/Health

information System/IS security, followed by 12.95 % of papers were from ICT/CT organization, 6.21% of papers were from Sociomateriality and continues.

- The Degree of Collaboration (DC) in this journal was 0.880 during the period between 2003 and 2017.
- The Collaborative Index (CI) was highest in the year 2006, i.e.1.31.
- The highest number 9.33% of papers were published in the year 2013 with the AGR 20% and followed by 8.37% in the year 2017 with highest AGR, i.e. 60%.
- Most prolific authors were Kalle Lyytinen from Sweden and Neil Pollock from UK.
- The research trend was towards ICT and Information Systems.

9. Conclusion

Now it's time to conclude. In 15 years, total 193 articles were published in the journal Information and Organization by various researchers/scientists and the maximum no of articles (18) published in the year 2013 and lowest number of articles (9) published in the year 2007. Most prolific authors are Kalle Lyytinen from Sweden and Neil Pollock from UK with highest number of publications. The rate of growth of articles in the last five years (2013-2017) was 6.25%. It is also seen that the authorship pattern was towards multiple authored articles**.** As expected, the USA is the top producing country with 146 publications (37.63%) of the total output. Case Western Reserve University and the London School of Economics were the top ranked institutes with 8 publications. After the detailed study of this journal, it is observed that the trend of research was moving towards an Information System (IS)/IS development/Gender & IS/IS Project management/IS & sustainability research/Health information System/IS security. Further, it is said that this analysis can be used for any kind journals. By analyzing the contents of the LIS journal, we could infer the future research areas in LIS, the emerging technologies and their significance.

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